**SCIENCE 10 EXAM REVIEW**

**Disclaimer: This should not be used as your only guide for what to study. All previous materials used in the course including but not limited to assignments, test, examples, and notes should be reviewed and consulted when preparing for this exam.**

**Motion:**

Definitions:

1. Distance
2. Time
3. Speed
4. Average velocity
5. Instantaneous velocity
6. Constant velocity
7. Acceleration
8. Displacement
9. Uniform motion

Concepts:

* + - 1. What is the relationship between slope and velocity on a displacement time graph?
      2. What is the significance of negative acceleration?

Problems:

1. A bird flies from its nest to a nearby building and then halfway back. If there exists 60 m between the building and the nest find …
   1. The distance b. The displacement
2. Explain the following graphs.
   1. b.   
        
      d (m) d (m)  
        
        
       t (s) t (s)
3. Use the graph on the right to:
   1. Calculate the slope of

the graphs. What do

they represent?

1. If a leopard runs at a constant velocity of 4.5 m/s for 5 minutes before stopping for a drink of water, what is the displacement of the leopard?
2. A whale swims at a velocity of 4 m/s (NE) until it sees its prey. The whale accelerates to 7.5 m/s. If it take 6 s to reach the prey, what was the displacement between the whale and the prey?
3. A NASCAR driver must hit the breaks to avoid a collision. He decelerates to a velocity of 9 m/s. If the car traveled 60 m after he hit the breaks in 5.5 s, what was the original velocity of the car?
4. A sled is sliding down a hill. At the top of the hill the sled is traveling with an initial velocity of 2 m/s. After sliding down the 70 m long hill the sled is travelling at a velocity of 4 m/s. How long did it take the sled to reach the bottom of the hill?
5. Krista has decided to go sky diving. Krista jumps from the plane and begins her decent traveling at a velocity of 6 m/s. 5.5 minutes later Krista pulls her chute. If Krista traveled 5 km in this time period what is her velocity at this point?
6. A woman runs with a constant acceleration of 0.3 m/s2 until she reaches a velocity of 2.3 m/s. How long would it take her to reach her final velocity?
7. Jess is trying to catch his goldfish that is traveling at a velocity of 0.02 km/h. Jess begins his chase from a velocity of 1.0 m/s and accelerates at a rate of 0.31 m/s2 for 7.4 s. What was Jess’s final velocity? Will Jess catch his fish?
8. A car traveling at a velocity of 30 m/s slams on its breaks and slides for 10 s before coming to a stop. Calculate the acceleration rate of the car.
9. Logan is driving his motorcycle with a velocity of 10 m/s prior to reaching the highway. Going up the on ramp to the highway Logan accelerates at a rate of 2.4 m/s2. How far would Logan travel before he reached a velocity of 40 m/s?
10. Convert the following to m/s
    1. 89 km/h b. 2.3 m/min

***\* Also go over the examples and information on displacement-time graphs***

**Ecology**

Definitions:

1. Artificial ecosystem
2. Natural ecosystem
3. Trophic levels
4. Consumer
5. Producer
6. Autotroph
7. Heterotroph
8. Decomposer
9. Herbivore
10. Carnivore
11. Omnivore
12. Biotic
13. Abiotic
14. Bioamplification
15. Habitat
16. Ecosystem
17. Community
18. Population
19. Ecological niche
20. Ecological footprint
21. Extinct
22. Extirpated
23. Threatened
24. Endangered
25. Vulnerable
26. Sustainable ecosystem
27. Food web
28. Photosynthesis
29. Cellular Respiration
30. Carbon Cycle
31. Nitrogen Cycle
32. Toxins
33. Ecology

Concepts:

1. Explain the difference between biotic and abiotic, provide an example of each…
2. Explain the difference between an individual, population and community.
3. Why is photosynthesis important in ecosystems? (think plants and energy)
4. Describe in your own words what bioamplification is; draw a diagram to illustrate your knowledge.
5. Write the equation for photosynthesis (plants) and cellular respiration (animals & plants).
6. Describe in your own words what the carbon cycle is.
7. The oceans are often described as a carbon reservoir. In what ways is carbon held within the oceans?
8. Discuss the nitrogen cycle and why it is important to all life forms.
9. Create a food web and a fully labeled energy pyramid for the following organisms assuming that the sun provides the producers with 10000 kcal of energy.

|  |  |
| --- | --- |
| **Organism** | **Food/Energy Source** |
| Foxes | Rabbits, mice |
| Rabbits | Grass |
| Mice | Grass, grasshoppers |
| Grass | Sun |
| Grasshoppers | Grass |
| Sparrows | Grasshoppers |
| Frogs | Grasshoppers |
| Hawks | Grasshoppers, Frogs, Sparrows, Snakes |
| Snakes | Rabbits, Frogs |

**Chemistry**

1. What is the difference between a chemical and physical property?
2. What are the group names for the elements in groups 1, 2, 17, and 18? What other two special names did you learn?
3. Which group is the least reactive and why?
4. What element is found in group 18, period 4?
5. What are between the metals and the nonmetals?
6. The metals are on which side of the periodic table? How about the nonmetals?
7. If you know the atomic number, for an atom, of an element, what two other things do you know?
8. What is an ion?
9. What two things are not equal in an ion?
10. What is the outer shell of an atom called?
11. What type of elements form ionic compounds? How do they bond?
12. What type of elements form molecular compounds? How do they bond?
13. What type of metals form more than one ion? Give two examples.
14. Explain the difference between a cation and an anion.
15. What are the prefixes for molecular compounds?
16. Complete the following table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element  Name | Element  Symbol | Number of Valence Electrons | Number of Electrons Lost/Gained | Complete Ion Symbol |
| Lithium |  |  |  |  |
| Magnesium |  |  |  |  |
| Oxygen |  |  |  |  |

1. Balance the following equations:
   1. N2 + H2 NH3
   2. Cu2O + C Cu + CO2
   3. C2H5OH + O2 CO2 + H2O
   4. Na + O2 Na2O
2. Write the formulas for the following compounds:
   1. Diphosphorous trioxide –
   2. Sulfur dioxide –
   3. Magnesium oxide -
   4. Potassium sulfide –
   5. Sodium fluoride -
   6. Carbon tetrachloride –
   7. Aluminum sulfide –
   8. Dinitrogen tetraoxide –
   9. Lead (IV) oxide –
3. List the rules for naming
   1. Ionic Compounds –
   2. Molecular Compounds –
4. Name the following compounds:
   1. FeCl3 –
   2. SnF4 –
   3. Na3N
   4. NO2–
   5. CCl4 –
5. Which type of compound am I – Ionic or Molecular?
   1. Made up of the transfer of electrons from a metal to a nonmetal -
   2. Dissolve in water to form a solution that conducts electricity -
   3. Formed from more than one nonmetal -
   4. Are non-electrolytes -
   5. Use prefixes when naming -
   6. Use –ide on the endings –
6. State the 5 reaction types and an example of each one.

**Weather**

1. What are lines of latitude? Can you find one on a map?
2. What are lines of longitude? Can you find one on a map?
3. What is the difference between weather and climate?
4. Name and describe four methods that energy can be transferred.
5. What is a heat sink?
6. Use a diagram and describe how we get our seasons.
7. Use a diagram and be able to describe how air pressure works.
8. Name, in order, the layers of our atmosphere.
9. Describe one important feature about each layer.
10. Describe, with a diagram, what the Coriolis Effect is.
11. What is our hydrosphere?
12. Be able to label a diagram of the water cycle.
13. Describe the effects of the ocean currents.
14. How do clouds form?
15. What are convective, frontal and orographic clouds?
16. What are the three ways to classify clouds?

**Significant Figures and Scientific Notation**

1. Express the following values in scientific notation.
   1. 14587.6
   2. 0.0000863
2. Express the following values in standard notation.
   1. 4.6 x 108
   2. 3.4 x 10-4
3. Round the following values to four significant digits.
   1. 0.0039729
   2. 1009.9

**Science 10 Exam Review Pack!**

**Chapters/Topics covered in Science 10**

|  |  |
| --- | --- |
| **Unit 1 - Sustainable Ecosystems**  1.1 – Silence of the frogs – Sensitive frogs, ecosystems, food chains, producer, consumer, detritus, decomposer, carni/herbi/omnivores  1.2 – Species at risk – extinct, extirpated, endangered, vulnerable, threatened  1.3 – Extinction in the modern world – causes, rates of extinction  1.5 – Ecology – biotic, population, community, ecotones  1.10 – Energy in ecosystems  1.11 – Energy Movement in ecosystems – ecological pyramid, auto/heterotrophs  2.1 – Cycling of matter - inorganic/organic  2.2 – Pesticide Case Study – uses and effects  2.5 – Carbon Cycle – photosynthesis and respiration, carbon sinks  2.7 – Agriculture and Nutrient cycles – N, P, and K  3.10 – Logging Forests – clear/selective cutting, effects of deforestation  3.11 – Acid Deposition – formation and effects | **Unit 2 – Chemical Changes**  5.1 – Chemistry, physical vs. chemical changes  5.5 – Elements and the periodic table – metals/nonmetals, families, periods, electron, neutron, proton  5.6 – how elements form compounds  5.8 – Ionic Compounds – formation, naming  5.9 – Polyatomic compounds – definition, names  5.11 – Molecular compounds – formation, naming  6.5 – Balancing equations  7.3 – Rate of reaction – catalyst, heat, surface area, concentration  - Know how to do Bohr diagrams for atoms, ions, and ionic compounds |
| **Unit 3 - Motion**  9.1 - distance and time and their units  -Unit conversions, e.g. m to km, m/s to km/h  9.2 - significant digits: X and / rule, and + and - rule  9.5 - Speed – constant, instantaneous, average, and formula for speed  9.7 - Understand how to draw and setup a graph  - Time always goes on x-axis and you always need your units  - Distance always goes on y-axis and you always need your units  - Your slope is your velocity in a distance-time graph!!!  10.2 - Understand how to compare speeds.  10.3 - Acceleration - Units  - Speed Time graphs – calculating acceleration using the slope, and distance travelled by the area under the slope.  - Word Problems – Speed and Acceleration | **Unit 4 - Weather**  13.1 - Weather vs. Climate, what affects weather  13.2 – Energy balance, albedo, heat capacity, electromagnetic spectrum, heat transfer  13.3 – Reasons for the seasons  13.4 - Atmosphere  13.6 – Wind, prevailing winds, local winds, jet streams, gusts, squalls  13.8 – Hydrosphere (water cycle)  13.9 – ocean currents  13.11 - Clouds |

**Physics Unit Exam Review Answers**

Definitions:

1. Distance – the amount of space between two points. Usually measured in meters.
2. Time - the duration between two events. Measured in seconds.
3. Speed – total distance divided by the total time. Measured in m/s
4. Average Velocity – the total displacement divided by the total time. Measured in m/s
5. Instantaneous velocity – the velocity an object is traveling at a given moment. Measured in m/s.
6. Constant Velocity – an object traveling with the same velocity over a period of time. Measured in m/s.
7. Acceleration – The rate at which an object is increasing its velocity each second. Measured in m/s2.
8. Displacement – How far an object has traveled in relation to its starting position.
9. Uniform Motion – Constant Velocity

Concepts:

1. What is the relationship between slope and velocity on a displacement time graph?

The slope represents the velocity of a particular object. The steeper the slope the greater the velocity the object is traveling with.

1. What is the significance of negative acceleration?

It indicates that the object is slowing down.

Problems:

1. A bird flies from its nest to a nearby building and then halfway back. If there exists 60 m between the building and the nest find …
   1. The distance = 90 m b. The displacement = 30 m
2. Explain the following graphs.
   1. b.   
        
      d (m) d (m)  
        
        
       t (s) t (s)  
      The object is not moving The object has returned to its starting positon
3. Use the graph on the right to:
   1. Calculate the slope of

the two lines on the   
graphs. What do

these line represent?

Mike =   
m = (-18 – 30)/(8 – 0)

m = -6 m/s

Carla =  
m = (-20 – 14)/ (8 – 0)

m = -4.25 m/s  
  
These values represent the velocity at which Mike and Carla are traveling.

1. If a leopard runs at a constant velocity of 4.5 m/s for 5 minutes before stopping for a drink of water, what is the displacement of the leopard?  
   X = Xo + t t = 5 min = 300 s  
   X = 0 + (4.5)(300)  
   X = 1350 m
2. A whale swims at a velocity of 4 m/s (NE) until it sees its prey. The whale accelerates to 7.5 m/s. If it take 6 s to reach the prey, what was the displacement between the whale and the prey?  
    = (v + vo)/2 X = Xo + t  
    = (7.5 = 4) / 2 X = 0 + (5.75)(6)  
    = 5.75 m/s X = 34.5 m
3. A NASCAR driver must hit the breaks to avoid a collision. He decelerates to a velocity of 9 m/s. If the car traveled 60 m after he hit the breaks in 5.5 s, what was the original velocity of the car?  
    = (X – Xo) / 2 vo = 2 - v  
    = (60 – 0) /2 vo = 2(30) - 9  
    = 30 m/s vo = 51 m/s
4. A sled is sliding down a hill. At the top of the hill the sled is traveling with an initial velocity of 2 m/s. After sliding down the 70 m long hill the sled is travelling at a velocity of 4 m/s. How long did it take the sled to reach the bottom of the hill?   
    = (v + vo) / 2 t = (X – Xo) /   
    = (4 + 2) / 2 t = (70 – 0) / 3  
    = 3 m/s t = 23.3 s
5. Krista has decided to go sky diving. Krista jumps from the plane and begins her decent traveling at a velocity of 6 m/s. 5.5 minutes later Krista pulls her chute. If Krista traveled 5 km in this time period what is her velocity at this point?  
    = (X – Xo) / t v = 2 - vo t = 5.5 \* 60 = 330 s  
    = (5000 – 0) / 330 v = 2(15.2) – 6 X = 5 \* 1000 = 5000 m  
    = 15.2 m/s v = 24.4 m/s
6. A woman starts running from rest with a constant acceleration of 0.3 m/s2 until she reaches a velocity of 2.3 m/s. How long would it take her to reach her final velocity?  
   t = (v –vo)/a  
   t = (2.3 – 0)/0.3  
   t = 7.7 s
7. Jess is trying to catch his goldfish that is traveling at a velocity of 0.02 km/h. Jess begins his chase from a velocity of 1.0 m/s and accelerates at a rate of 0.31 m/s2 for 7.4 s. What was Jess’s final velocity? Will Jess catch his fish?  
   Goldfish velocity = 0.02 km/h = 0.0056 m/s  
   v = vo + at  
   v = 1 + (0.31)(7.4)  
   v = 3.3 m/s  
   Jess is traveling faster than his fish therefore he will eventually catch his fish.
8. A car traveling at a velocity of 30 m/s slams on its breaks and slides for 10 s before coming to a stop. Calculate the acceleration rate of the car.   
   a = (v - vo)/t  
   a = (0 – 30)/10  
   a = -3 m/s2
9. Logan is driving his motorcycle with a velocity of 10 m/s prior to reaching the highway. Going up the on ramp to the highway Logan accelerates at a rate of 2.4 m/s2. How far would Logan travel before he reached a velocity of 40 m/s?  
    = (v + vo)/2 t = (v – vo)/a X = Xo + t  
    = (40 + 10)/2 t = (40 – 10)/2.4 X = 0 + (25)(12.5)  
    = 25 m/s t = 12.5 s X = 312.5 m
10. Convert the following to m/s
    1. 89 km/h = 24.7 m/s b. 2.3 m/min = 0.038 m/s

**Ecosystems Unit Exam Review - here are some key terms that were associated with this unit, find them and define them!**

Artificial Ecosystem, Natural Ecosystem, Trophic Levels, Consumer, Producer, Autotroph, Heterotroph, Decomposer, Herbivore, Carnivore, Omnivore, Biotic, Abiotic, Bioamplification, Habitat, Ecosystem, Community, Population, Ecological Niche, Ecological Footprint, Extinct, Extirpated, Threatened, Endangered, Vulnerable, Sustainable Ecosystem, Food Web, Photosynthesis, Cellular Respiration, Carbon Cycle, Nitrogen Cycle, Toxins, Ecology

**Concepts:**

1. Explain the difference between biotic and abiotic, provide an example of each…

The difference between biotic and abiotic factors is that biotic factors, such as plants & animals, are living or are an effect of living things, while abiotic factors, such as temperature or wind, are all non-living.

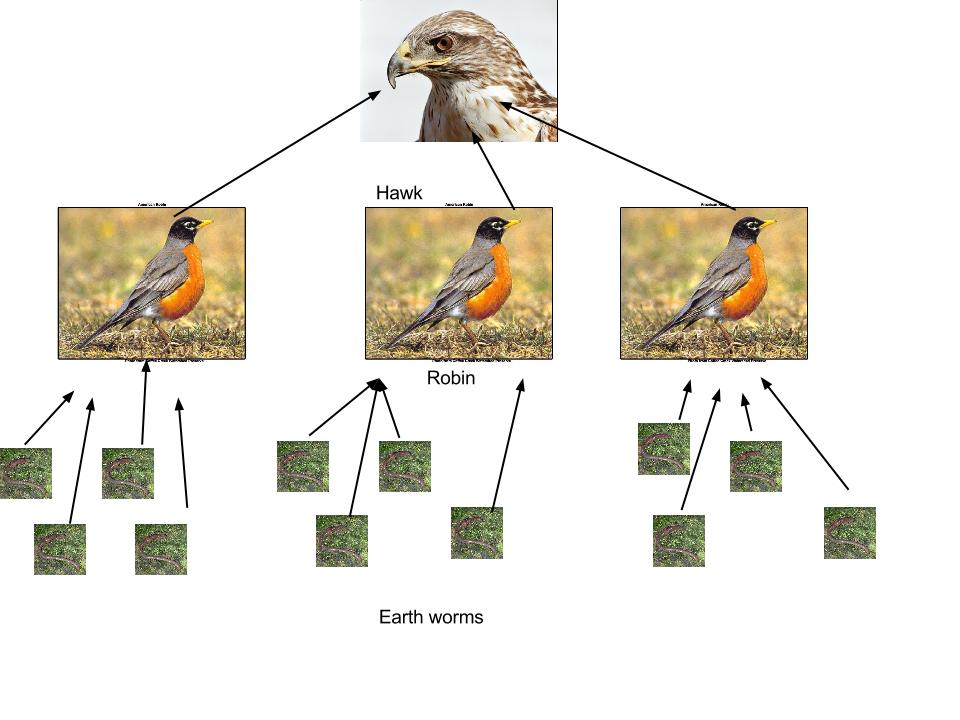
1. Explain the difference between an individual, population and community.

The difference between an individual, population and community is that a population refers to the number of one species only in an ecosystem while community refers to all species in an ecosystem, and an individual is one plant or animal alone.

1. Why is photosynthesis important in ecosystems?

Photosynthesis is important in ecosystems because it is plants which harness the energy of the sun by converting it into food energy, which can then be passed on through the food chain. Plants also keep atmospheric CO2 levels balanced by using it for photosynthesis, and release oxygen during the process as well, which all animals need for respiration.

1. Describe in your own words what bioamplification is, draw a diagram to illustrate your knowledge.   
   Bioamplification is when the concentration of toxins increases as they are passed up the food chain, resulting in dangerous levels for animals such as the hawk.



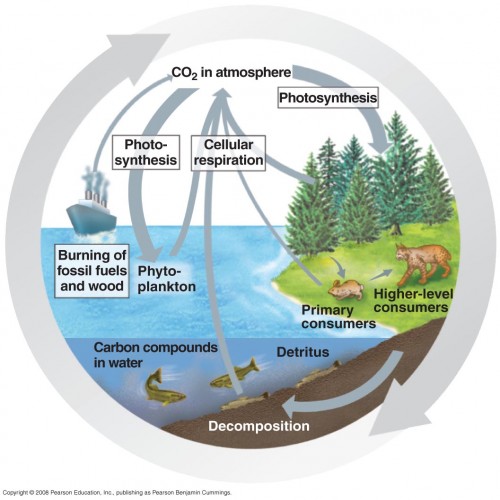
1. Write the equation for photosynthesis (plants) and cellular respiration (animals & plants).

Photosynthesis: energy + water + CO2 🡺 sugars + O2

Respiration: sugars + O2 🡺 energy + water + CO2

1. Describe in your own words what the carbon cycle is.

The carbon cycle is the path that carbon takes from CO2 in the atmosphere to plants, where the carbon is used to make sugars during photosynthesis, and can then end up in many different places as it moves around the food chain – proteins in humans, shells of oysters, etc. It can also end up as fossil fuels – oil, gasoline, coal, wood. This carbon can then returned to the atmosphere by the respiration of animals (breathing out CO2) or by burning fossil fuels (also releasing CO2), and the cycle continues.



1. The oceans are often described as a carbon reservoir. In what ways is carbon held within the oceans?   
   Carbon is held in the ocean as CO2 that has dissolved into the water, carbon that is part of sea life (mainly as CaCO3 in the shells of small marine animals), and as sediment/rock at the bottom of the ocean that has formed out of the shells of those living things as they died.
2. Discuss the nitrogen cycle and why it is important to all life forms.   
   All living organisms are composed of nitrogen. The major gaseous component of Earth’s atmosphere is Nitrogen. In order for atmospheric nitrogen to be used by living organisms it however must be converted into a useable form through nitrogen fixation. Nitrogen fixation is done either by bacteria in the roots of plants or by lightning.
3. Create a food web and a fully labeled energy pyramid for the following organisms assuming that the sun provides the producers with 10000 kcal of energy.

SEE YOUR TEACHER TO HAVE YOUR ANSWER VALIDATED

**Chemistry Unit Exam Review**

1. What is the difference between a chemical and physical property?

A chemical property is associated with a chemical reaction (ex. Gasoline is flammable); while a physical property is associated with a physical reaction or trait (ex. water boils at 100oC, copper is shiny).

1. What are the group names for the elements in groups 1, 2, 17, and 18? What other two special names did you learn?

Group1 – Alkalai metals

Group2 – Alkalai Earth metals

Group 17 – Halogens

Group 18 – Noble gases

We also learned about metalloids which are found along the “staircase” in between the metals and non-metals, and transition metals which are groups 3-12.

1. Which group is the least reactive and why?

Noble gases are the least reactive because they already have a full valence shell (they don’t need to lose or gain any electrons).

1. What element is found in group 18, period 4?

Krypton.

1. What are between the metals and the nonmetals?

Metalloids.

1. The metals are on which side of the periodic table? How about the nonmetals?

Metals on the left, non-metals on the right.

1. If you know the atomic number of an element, what two other things do you know?

Number of protons and electrons.

1. mass number – atomic number = \_\_number of neutrons\_\_\_\_
2. What is an ion? What two things are not equal in an ion?

An ion is a charged atom, where number of electrons are no longer equal to the number of protons.

1. What is the outer shell of an atom called?

The outer shell of an atom is called the valence shell.

1. What type of elements form ionic compounds? How do they bond?

An ionic compound is formed by metal ions and non-metal ions. They bond through the attraction of the positive charge of the metal ion with the negative charge of the non-metal ion.

1. What type of elements form molecular compounds? How do they bond?

Molecular compounds are formed by non-metals only. They bond by sharing electrons (covalent bonds).

1. List the diatomic molecules.

Iodine, Bromine, Chlorine, Fluorine, Oxygen, Nitrogen, Hydrogen.

1. What type of metals form more than one ion? Give two examples.

Multivalent ions form more than one ion (ex. Iron and Copper).

1. What are the prefixes for molecular compounds?

Mono – 1, Di – 2, Tri – 3, Tetra – 4, Penta – 5, Hexa – 6, Hepta – 7, Octa - 8, Nana – 9, Deca – 10.

1. Complete the following table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Element  Name | http://twinkle_toes_engineering.home.comcast.net/~twinkle_toes_engineering/lithium_orbits_wiki.pngElement Symbol | Bohr  Diagram | Number of Valence Electrons | Tendency to Gain or Lose Electrons | Symbol of Ion formed |
| Lithium | Li |  | 1 | Lose 1 | Li1+ |
| Magnesium | http://0.tqn.com/d/chemistry/1/0/7/9/1/magnesiumatom.jpgMg |  | 2 | Lose 2 | Mg2+ |
| Chlorine | http://0.tqn.com/d/chemistry/1/0/F/9/1/chlorineatom.jpgCl |  | 7 | Gain 1 | Cl- |

1. Complete the following table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Atomic Number | Mass Number | # Protons | # Electrons | # Neutrons |
| 9 | 19 | 9 | 9 | 10 |
| 20 | 40 | 20 | 20 | 20 |
| 26 | 56 | 26 | 26 | 30 |
| 35 | 80 | 35 | 35 | 45 |

1. What are three things that affect the rate of a reaction?

Rate of reaction can be affected by temperature, concentration, surface area, and catalysts.

1. What are acids and bases?

Acids are substances that have a pH between 0 and 7.0, bases are substance that have a pH between 7.0 and 14.

1. Count the atoms (include an individual count and a total):
   1. Na2CO3  c. 3(NH4)2Cr2N2

Na – 2 N – 12

C – 1 H – 24

O – 3 Cr – 6

* 1. 3CaCl2 d. Pb(NO3) 2

Ca – 3 Pb – 2

Cl – 6 N – 2

O – 3

1. Balance the following equations:
   1. N2 + 3H2 2NH3
   2. 2Cu2O + C 4Cu + CO2
   3. C2H5OH + 3 O2 2CO2 + 3 H2O
   4. 4Na + O2 2Na2O
2. Write the formulas for the following compounds:
   1. Diphosphorous trioxide – P2O3
   2. Sulfur dioxide – SO2
   3. Magnesium oxide - MgO
   4. Potassium sulfide – K2S
   5. Sodium fluoride - NaF
   6. Carbon tetrachloride – CCl4
   7. Aluminum sulfide – Al2S3
   8. Dinitrogen tetraoxide – N2O4
   9. Lead (IV) oxide – PbO2
3. List the rules for naming
   1. Ionic Compounds – Metal name comes first, non-metal second. Ending of non metal changes to –ide, unless it is a polyatomic anion, where the table of common polyatomic ions is used. If metal is multivalent, the charge must be specified with a roman numeral.
   2. Molecular Compounds – Prefixes are used. Ending of second non-metal changes to –ide. If there is only one of the first non-metal, the prefix mono is not needed as it is assumed there is only one of them.
4. Name the following compounds:
   1. FeCl3 – iron (III) chloride  c. Na3N – sodium nitride
   2. SnF4 – tin (IV) fluoride d. NO2 – nitrogen dioxidee. CCl4 – carbon tetrachloride
5. Which type of compound am I – Ionic or Molecular?
   1. Made up of the transfer of electrons from a metal to a nonmetal - I
   2. Dissolve in water to form a solution that conducts electricity - I
   3. Formed from more than one nonmetal - M
   4. Are non-electrolytes - M
   5. Use prefixes when naming - M
   6. Use –ide on the endings – can be both

**Weather Unit Exam Review**

1. What are lines of latitude? Can you find one on a map?

Latitude lines are imaginary lines that run east to west on a map and measure north and south. The equator is found at 0 degrees latitude.

1. What are lines of longitude? Can you find one on a map?

Lines of longitude are imaginary lines that run north to south on a mpa, but measure east to west. The prime meridian runs through 0 degrees longitude.

1. What is the difference between weather and climate?

Weather – day to day conditions ex. Cloudy, hot, 25 degrees and sunny.

Climate – weather conditions averaged over many years. Ex. The average temperature in NB in July is 25 degrees Celsius.

1. Name and describe four methods that energy can be transferred.

Radiation – the transfer of energy by electromagnetic waves. Does not require a medium. Only one that comes through space.

Convection - transfer of energy by vertical movement of particles in a **fluid** (liquid/gas)

Advection – Horizontal transfer of energy through the collision of particles in a liquid or gas

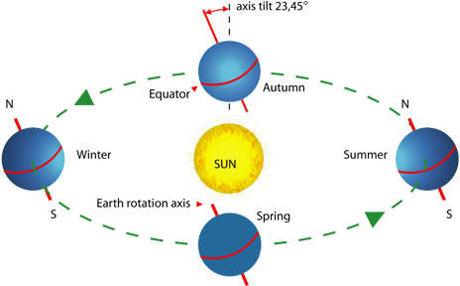
Conduction - the transfer of energy which occurs when a particle with high energy hits a particle with lower energy in a solid

1. What is a heat sink?

Something that absorbs heat energy and becomes warmer.

1. Use a diagram and describe how we get our seasons.

Our seasons are due to the tilt of the Earth. In the summer, Earth’s Northern Hemisphere is tilted towards the sun, providing us with more direct sunlight, resulting in higher temperatures. In winter, Earth’s Northern Hemisphere is pointed away from the sun, which widely spreads out the suns energy, resulting in lower temperatures.



1. Use a diagram and be able to describe how air pressure works.

Air pressure is the air above us pushing down on us. No diagram needed.

1. Name, in order, the layers of our atmosphere.

Troposhpere, Tropopause, Stratosphere, Mesosphere, Thermosphere, Exosphere

1. Describe one important feature about each layer.

Troposphere – Layer closest to Earth, responsible for most of our weather systems.

Tropopause – The layer where the troposphere ends and the stratosphere begins.

Stratosphere – Contains the majority of the ozone layer.

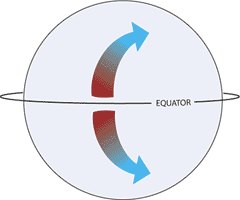
Mesosphere – The middle layer, very cold.

Thermosphere – Higher temperature, where the Aurora Borealis (northern lights) occur.

Exosphere – Outermost layer, can be considered space what particles are there (mainly   
 hydrogen) are very spread out.

1. Describe, with a diagram, what the Coriolis Effect is.

Coriolis Effect is the apparent change in direction of a moving object in a rotating system.

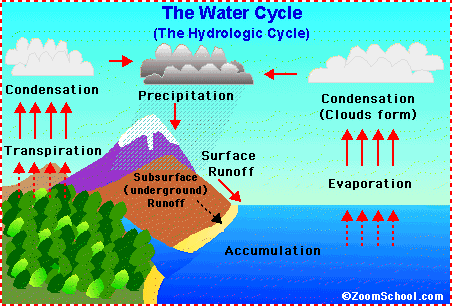


1. What is our hydrosphere?

All the water on our planet makes up the hydrosphere.

1. Be able to label a diagram of the water cycle.

Label precipitation, condensation, sublimation, surface runoff, radiant energy, evaporation.



1. Describe the effects of the ocean currents.

Ocean currents carry the suns energy from the equator towards the poles, and bring precipitation over land as they evaporate and form clouds. They are affect air pressure – warmer oceans produce lower air pressure that can lead to storms.

1. How do clouds form?

Clouds are formed by the condensation of water vapour.

1. What are convective, frontal and orographic clouds?

Convective clouds – produced as warm air rises, cools, and condenses.

Frontal clouds – form as a warm front meets a cold front. As these air masses meet the warm air cools quickly, condenses, and forms clouds.

Orographic clouds – form as moist air hits a mountain, rises and condenses, forming clouds.

1. What are the three ways to classify clouds?

Clouds can be classified as cumulus, stratus, or cirrus clouds.

**Significant Figures and Scientific Notation**

1. Express the following values in scientific notation.
   1. 14587.6 = 1.5 x 104
   2. 0.0000863 = 8.6 x 105
2. Express the following values in standard notation.
   1. 4.6 x 108 = 460 000 000
   2. 3.4 x 10-4 = 0.000 34
3. Round the following values to four significant digits.
   1. 0.0039729 = 0.003973 or 3.973 x 10-3
   2. 1009.9 = 1010 or 1.010 x 103